What is claimed is:

1. A data generating apparatus, comprising:

an input device inputting a condition for designating a finite field;

a generation device automatically generating expression data of the finite field based on the inputted condition; and

an expression data storage device storing the generated expression data.

2. The data generating apparatus according to claim 1, further comprising

an operation device performing a finite field operation based on the expression data stored in said expression data storage device.

3. The data generating apparatus according to claim 1, wherein when a bit length of a prime number which describes the finite field is inputted as the condition, said generation device automatically generates prime number data corresponding to the bit length and stores the generated prime number data in said expression data storage device.

4. The data generating apparatus according to claim 1, wherein when an extension degree which describes the finite field is inputted as the condition, said generation device automatically generates irreducible polynomial data corresponding to the extension degree and stores the irreducible polynomial data in said expression data storage device.

5. The data generating apparatus according to claim 4, wherein when an instruction using an optimal normal basis is inputted, said generation device automatically generates irreducible polynomial data for an optimal normal basis corresponding to the extension degree and the irreducible polynomial data for an optimal normal basis in said expression data storage device.

6. The data generating apparatus according to claim 1, further comprising

a fixed data storage device storing one or more pieces of predetermined expression data of a finite field,

said generation device stores expression data of a finite field corresponding to the condition in said expression data storage device if there is the

expression data of a finite field corresponding to the condition in the fixed data storage device, and said generation device automatically generates expression data of a finite field corresponding to the condition if there is no expression data of a finite field corresponding to the condition in the fixed data storage device.

7. The data generating apparatus according to claim 1, further comprising:

a designation device designating expression data of a finite field; and

a verifier device verifying whether the designated expression data are suitable,

the verifier device sores designated expression data in said expression data storage device if the designated expression data are suitable, and the verifier device asks the designation device for other expression data if the designated expression data are not suitable.

8. A computer-readable storage medium on which is recorded a program enabling a computer to execute a process, said process comprising:

automatically generating expression data of a

finite field based on an inputted condition if the condition for designating the finite field is inputted; and

outputting the generated expression data.

9. A data generating method, comprising:

designating a condition for designating a finite field;

automatically generating expression data of the finite field based on the designated condition; and

supplying the generated expression data to a finite field operation apparatus.

10. A data generating apparatus, comprising:

inputting means for inputting a condition for designating a finite field;

generating means for automatically generating expression data of the finite field based on the inputted condition; and

expression data storing means for storing the generated expression data.